96M4281o

Single Board Computer

User's Manual

Version 1.0

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How to Use This Manual

The manual describes how to configure your 96M4281o system to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Board Computer.

Chapter 1 : System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single board computer.

Chapter 2 : Hardware Configuration. Shows the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3 : System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4 : BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5 : Troubleshooting. Provides various useful tips to quickly get 96M4281o running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions. **DSM Computer AG** may make supplement or change in the products described in this document at any time.

Updates to this manual, technical clarification, and answers to frequently asked questions will be shown on the following web site : http://www.DSM.AG.

Chapter 1
System Overview

1.1 Introduction

96M4281o, PICMG 1.0 SBC (Slot Board Computer) is designed with Intel® Core™ Duo / Core™2 Duo / Core™ Solo processors with a 533/667MHz front side bus. It adopts Intel® 82945GME Graphics Memory Controller Hub and the Intel® ICH7-M DH I/O Controller Hub. The Mobile Intel® 945GME Express chipset's low power design enables less average power consumption compared to previous generations.

The Intel 82945GME and ICH7-M DH delivers outstanding system performance through high-bandwidth interface such as dual–channel DDR2 667/533 DIMM sockets up to 4GB, and two Serial ATA high-speed data transferring at up to 1.5Gb/s. Dual Gigabit Ethernet ports offer PCI Express x1 based 10/100/1000 Ethernet connection for fast networking access. Additionally, the new Intel® Graphics Media Accelerator 950 graphics core is also built into the Mobile Intel® 945GME chipset which provides excellent graphics performance over the previous generation chipset. Other features include two serial ports, 8 USB 2.0, watchdog timer, and hardware monitoring function.

In addition, 96M4281o, together with Intel® Matrix Storage Technology, it adds support for RAID 0, 1 level providing quick access to data and protection against data loss for maximum performance, protection and upgradeability.

96M4281o features:

- Support Intel® Core Duo, Core 2 Duo, Core Solo processor with 667/533MHz Front Side Bus
- Dual 240-pin DDR2 SDRAM DIMM socket, support for DDR2 800/667 DIMMs, up to 4GB system memory (~3,2GB usable for OS)
- Intel® 945GME integrated GMA 950 technology offer performance graphics
- Equipped dual Intel 82573L Gigabit Ethernet ports
- Support CRT, LVDS and optional DVI on board
- Dual Gigabit Ethernet ports that based on PCI Express x1 interface without sharing bandwidth of PCI expansion bus
- Support RAID function (RAID 0, 1)

1.2 Check List

The 96M4281o package should cover the following basic items:

- ✓ One 96M4281o Industrial Mainboard
- ✓ One SATA cable
- ✓ One IDE cable
- ✓ One LPT cable w/ bracket
- ✓ One FDD cable
- ✓ One DVI cable
- ✓ One two ports Serial cable w/ bracket
- ✓ One USB cable w/ bracket
- ✓ One KB/MS Y cable
- ✓ One 4-pin ATX power cable

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

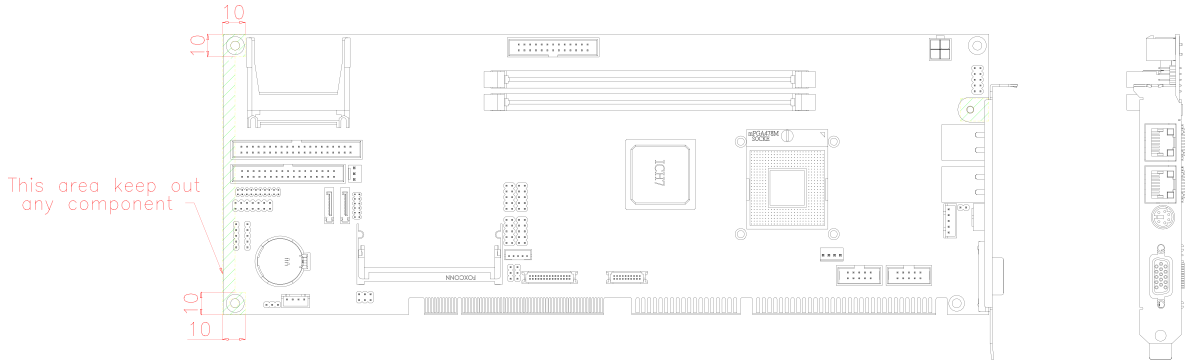
1.3 Product Specification

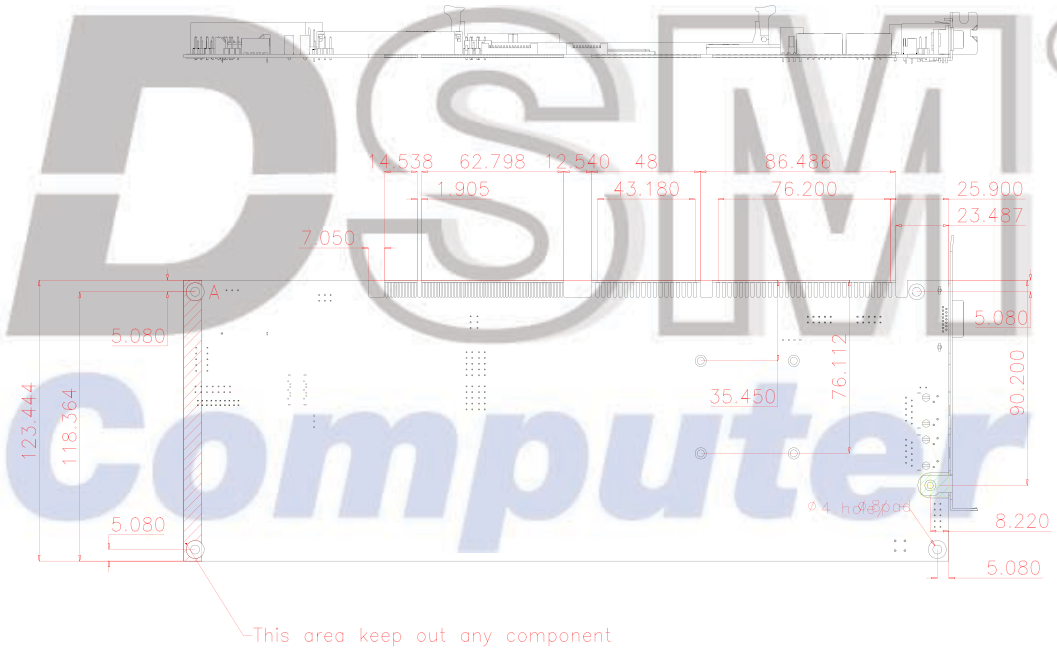
- **Main processor**
  CPU & Package: Intel® Core Duo/ Core Solo/ Core 2 Duo (Merom) processor
  FSB: 667/533MHz
- **BIOS**
  Phoenix (Award) system BIOS with 8Mb Flash ROM
- **Main Memory**
  - Support dual-channel & signal channel DDR2 memory interface
  - Non-ECC and non-buffered
  - Up to 4GB DDR2 667/533 SDRAM on two 240pin DIMM sockets
- **L2 Cache Memory**
  Built in processor
- **Chipset**
  Intel 945GME and ICH7-M DH chipset
- **Bus Interface**
  - Follow PICMG 1.0 Rev 2.0 standard (32-bit PCI and 16-bit ISA)
  - Fully complies with PCI Local Bus specification V2.2 (support 4 master PCI slots)
- **PCI IDE Interface**
  Support one Ultra DMA100 IDE port

- **SATA Interface**
  Two SATA 1.5Gb ports
- **Serial Ports**
  Support two serial ports, (RS-232x1, One RS-232/422/485 selectable)
- **Floppy Drive Interface**
  Support one FDD port up to two floppy drives and 5-1/4"(360K, 1.2MB), 3-1/2" (720K, 1.2MB, 1.44MB, 2.88MB) diskette format and 3-mode FDD
- **Parallel Port**
  Support one parallel port
- **USB Interface**
  Support eight USB (Universal Serial Bus) ports on-board for high-speed I/O peripheral devices.
- **PS/2 Mouse and Keyboard Interface**
  Support one 6-pin mini-DIN connector at rear I/O panel for PS/2 keyboard/mouse
- **Audio Interface**
  - Realtek ALC655 5.1 channel Audio
  - Connector and header of Line-in/Line-out/MIC for external and internal usage
- **Auxiliary I/O Interfaces**
  System reset switch, external speaker, Keyboard lock and HDD active LED, etc
- **Real Time Clock/Calendar (RTC)**
  Support Y2K Real Time Clock/Calendar with battery backup for 7-year data retention
- **Watchdog Timer**
  - Support WDT function through software programming for enable/disable and interval setting
  - Generate system reset
- **CompactFlash**
  - True IDE mode, compatibles with the ATA/ATAPI-4 specification
  - One Type II CF socket on secondary IDE channel
- **External Interface**
  Support one Mini PCI interface
- **On-board VGA**
  - GMCH integrated GMA 950
  - Share system memory up to 224MB for system memory
  - Support LVDS interface
  - Support optional DVO to DVI interface
- **On-board Ethernet LAN**
  Dual Gigabit (10/100/1000 Mbits/sec) LAN port using the Intel 82573L Gigabit Ethernet Controller

- **High Driving GPIO**
  Support 8-bit programmable high driving GPIO
- **Cooling Fans**
  Support one 4-pin power connector for CPU cooler and one 3-pin power connector for system fan
- **System Monitoring Feature**
  Monitor CPU temperature, system temperature and major power sources, etc
- **Bracket**
  Support dual Ethernet port with 2 indicators, one MINI-DIN 6 PS/2 KB/MS port and one CRT port
- **Outline Dimension (L X W):**
  338.5mm (13.33") X 122mm (4.8")
- **Power Requirements:**
- **Configuration:**
  - +12V (CPU) @2.2A
  - +12V (System) @1.1A
  - +5V (System) @ 5.31A
  - Test configuration:
    - CPU: Intel®Core™2 CPU T7200 2.0MHz (166*12) FSB:667MHz L2:4096K
    - Memory: Transcend 2GB DDR2 667(SAMSUNG K4T1G0840A-ZCE6)
    - HDD: Seagate ST380817AS 80G
    - OS: Windows 2000 Pro
    - Test Programs: BurnIn Test V4.0
    - Connected Fans: Only CPU fan connected
    - Run Time: 30 minutes
- **Operating Temperature:**
  0°C ~ 55°C
- **Storage Temperature:**
  -20°C ~ 80°C
- **Relative Humidity:**
  0% ~ 95%, non-condensing

1.3.1 Mechanical Drawing





1.4 System Architecture

96M4281o includes Intel 945GME PCI Express chipset, Intel 82573L PCI Express x1 interface Gigabit Ethernet controller and Winbond Super I/O.

The 945GME chipset supports the latest Intel Core Duo/ Core Solo processors with 667/533MHz front side bus; integrated GMA950 that cover CRT, LVDS and additional display interface - DVI. Up to 4GB DDR2 667/533 system memory in dual DIMM sockets; one CF socket; one Mini PCI socket; two 1.5Gb SATA ports; one Ultra DMA 100 IDE port; and eight USB 2.0 on 96M4281o.

W83628G is a PCI-to ISA bus conversion IC and W83629G is a condensed centralizes IC for IRQ and DMA control, together form a completed set for the PCI-to-ISA Bridge.

Winboard Super I/O W83627THG provides connection of PS/2 interface keyboard & mouse; dual serial port; one parallel port; IrDA and GPIO interface.

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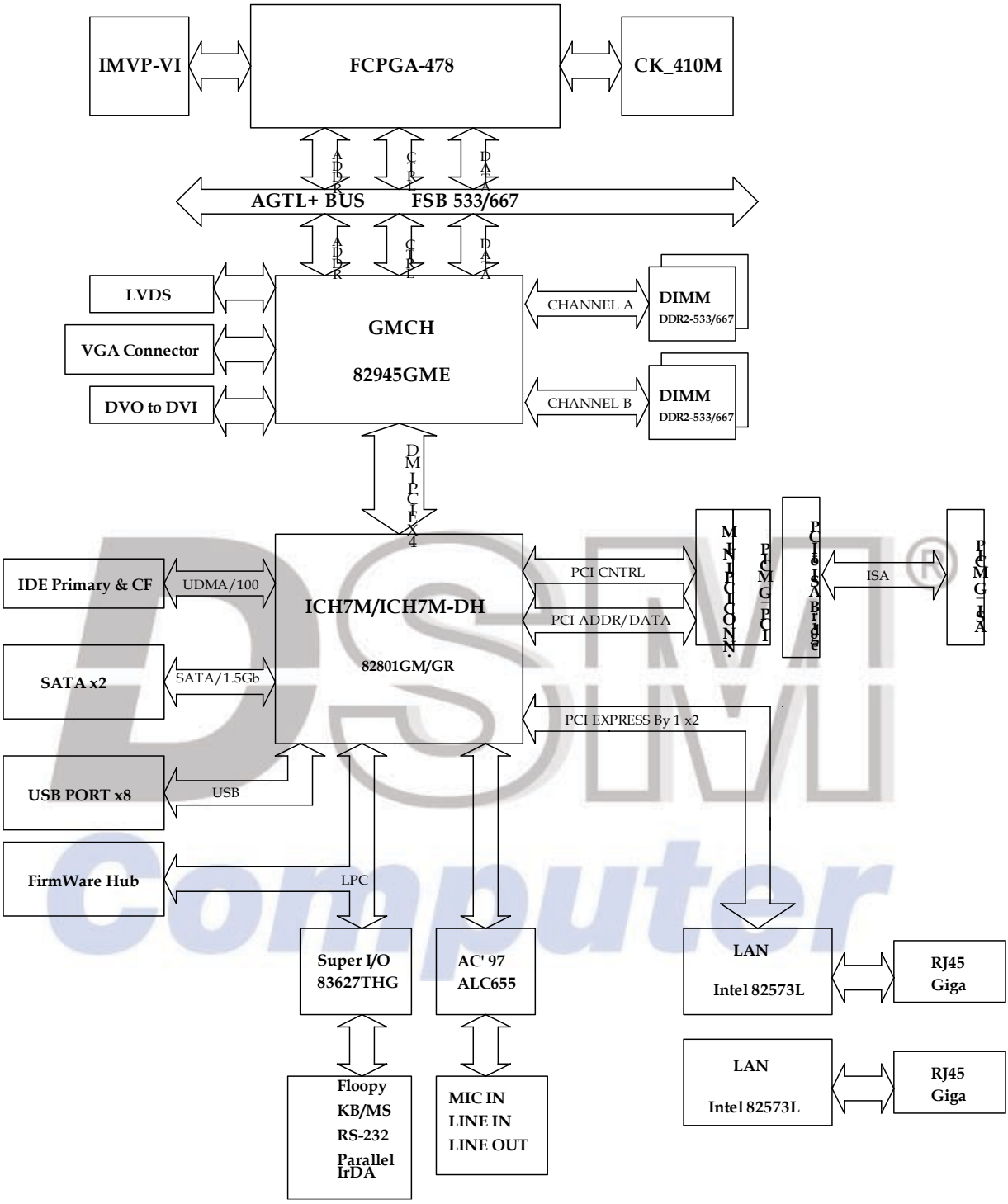

96M4281o Block Diagram

Chapter 2
Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connector. All of the configuration jumpers on 96M4281o are in the proper position. The default settings shipped from factory are marked with a star (★).

2.1 Jumper Setting

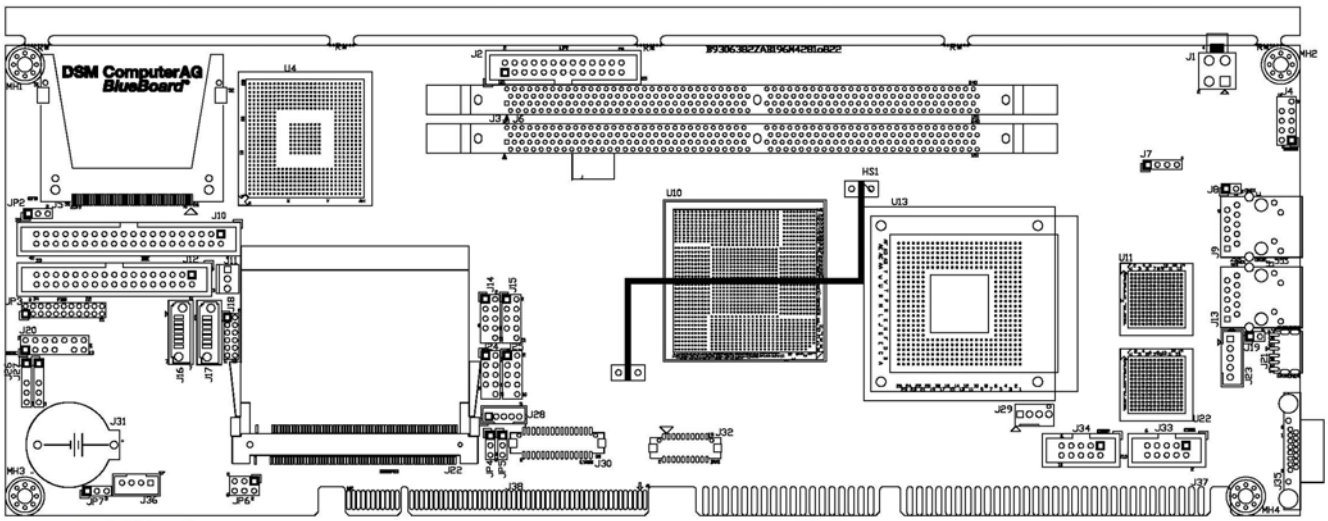

Figure 2-1 96M4281o Jumper & Connector Location

Computer

JP2 : CF mode selection

JP2	Function
1-2	Slave Mode
2-3	Master Mode ★

JP3 : COM2 RS232/485/422 Selection

JP3	Function
RS232	5-6,9-11,10-12,15-17,16-18 ★
RS485	1-2,7-9,8-10,19-20
RS422	3-4,7-9,8-10,13-15,14-16,21-22

JP4 : LVDS Power Level

JP4	Process Selection
1-2	3.3V ★
2-3	5V

JP5 : LVDS Back-light Power Level

JP5	Process Selection
1-2	3.3V★
2-3	5V

JP6 : AT/ATX Power Supply Selection

JP6	Process Selection
3-5, 4-6	ATX Power Supply ★
1-3, 2-4	AT Power Supply

JP7 : RTC CMOS Clear Jumper Setting

JP7	Function
1-2	Normal Operation ★
2-3	Clear CMOS Contents

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2.2 Connector Allocation

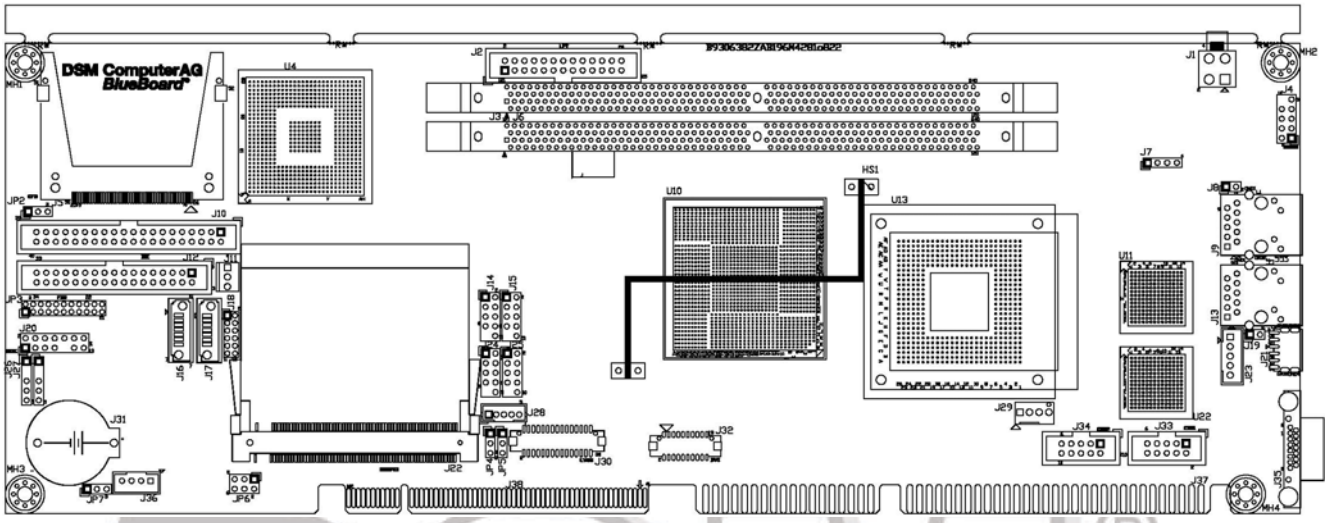

Figure 2-2 96M4281o Jumper & Connector Location

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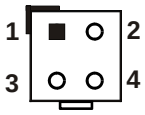
Pin Assignments of Connectors

J1 : 4P Power Connector for CPU POWER 12V



PIN No.	Signal Description
1	Ground
2	Ground
3	+12V
4	+12V

J2 : Parallel Port Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Strobe#	14	Auto form Feed#
2	Data 0	15	Error#
3	Data 1	16	Initialization#
4	Data 2	17	Printer Select IN#
5	Data 3	18	Ground
6	Data 4	19	Ground
7	Data 5	20	Ground
8	Data 6	21	Ground
9	Data 7	22	Ground
10	Acknowledge#	23	Ground
11	Busy	24	Ground
12	Paper Empty	25	Ground
13	Printer Select	26	N/C

J4 : Audio Header

PIN No.	Signal Description
1	MIC Power
2	AGND
3	LINE IN Left
4	AGND
5	LINE IN Right
6	AGND
7	LINE OUT Left
8	AGND
9	LINE OUT Right

J5 : Compact Flash Socket

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	Data 3
3	Data 4	4	Data 5
5	Data 6	6	Data 7
7	SDCS#0	8	Ground
9	Ground	10	Ground
11	Ground	12	Ground
13	+5V	14	Ground
15	Ground	16	Ground
17	Ground	18	SA2
19	SA1	20	SA0
21	Data 0	22	Data 1
23	Data 2	24	NC
25	NC	26	NC
27	Data 11	28	Data 12
29	Data 13	30	Data 14
31	Data 15	32	SDCS#3
33	Ground	34	IOR#
35	IOW#	36	WE#
37	INT	38	+5V
39	Ground	40	NC
41	RESET#	42	IORDY
43	NC	44	REQ
45	IDEACT#	46	PDIAG#
47	Data 8	48	Data 9
49	Data 10	50	Ground

J7 : CD-IN Header

PIN No.	Signal Description
1	CD-L
2	CDGND
3	CDGND
4	CD-R

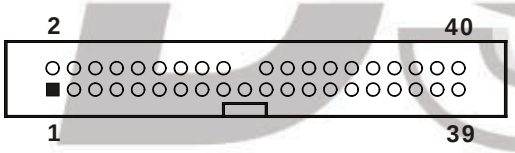
J8/J19 : LAN LED Pin Header

PIN No.	Signal Description
1	LED+
2	LED-

J9/J13 : Ethernet RJ-45 Interface Connector

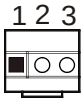
PIN No.	Signal Description
1	MDI_2P
2	MDI_0P
3	MDI_0N
4	+1.8V
5	MDI_2N
6	MDI_3P
7	GND
8	MDI_1P
9	MDI_1N
10	MDI_3N
11	ACT#
12	LINK#
13	LINK100#
14	LINK1000#

J10 : IDE Interface Connector



PIN No.	Signal Description	PIN No.	Signal Description
1	RESET#	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	N/C
21	DMA REQ	22	Ground
23	IOW#	24	Ground
25	IOR#	26	Ground
27	IOCHRDY	28	Pull-down
29	DMA ACK#	30	Ground
31	INT REQ	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD Active#	40	Ground

J11 : 3P FAN Power Connector

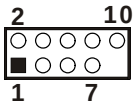


PIN No.	Signal Description
1	Ground
2	+12V
3	Fan Speed Detecting signal

J12: FDD Interface Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	DRVDEN0
3	Ground	4	NC
5	Ground	6	LPC_SMI#
7	Ground	8	INDEX#
9	Ground	10	MOA#
11	Ground	12	N/C
13	Ground	14	DSA#
15	Ground	16	N/C
17	Ground	18	DIR#
19	Ground	20	STEP#
21	Ground	22	WD#
23	Ground	24	WE#
25	Ground	26	TRAK0#
27	Ground	28	WPT#
29	N/C	30	RDATA#
31	Ground	32	HEAD#
33	N/C	34	DSKCJG#

J14/J15/J24/J25 : Dual Port USB Header



PIN No.	Signal Description	PIN No.	Signal Description
1	+5V	2	+5V
3	USBDATA-	4	USBDATA-
5	USBDATA+	6	USBDATA+
7	Ground	8	Ground
		10	NC

J18 : 8-Bit GPIO Header

PIN No.	Signal Description
1	Ground
2	Ground
3	GPIO1
4	GPIO5
5	GPIO2
6	GPIO6
7	GPIO3
8	GPIO7
9	GPIO4
10	GPIO8
11	+5V
12	+12V

J20 : Miscellaneous Header

(Pin1-3 : HDD LED. Pin2-4-6 : Power LED, Pin5-7: Reset Button, Pin11-13: Power Button, Pin8-10-12-14: Speaker Header)

PIN No.	Signal Description	PIN No.	Signal Description
1	HDD LED+	2	POWER LED+
3	HDD LED-	4	N/C
5	RESET BUTTON +	6	POWER LED-
7	RESET BUTTON -	8	SPEAKER +
9		10	N/C
11	POWER BUTTON +	12	N/C
13	POWER BUTTON -	14	SPEAKER -

J21 : Keyboard & Mouse Connector (Mini DIN 6)

PIN No.	Signal Description
1	Keyboard DATA
2	Mouse DATA
3	Ground
4	+5V
5	Keyboard Clock
6	Mouse Clock

J22 : External Keyboard Connector

PIN No.	Signal Description
1	+5V
2	Ground
3	N/C
4	Keyboard Data
5	Keyboard Clock

J26 : IrDA Header

PIN No.	Signal Description
1	+5V
2	
3	IRRX
4	Ground
5	IRTX

J27 : SM BUS Header

PIN No.	Signal Description
1	SM BUS Clock
2	
3	Ground
4	SM BUS DATA
5	+3VSB

J28 : LVDS Panel Back-light Power Connector

PIN No.	Signal Description
1	Backlight Power (select by JP5)
2	Ground
3	+12V
4	Ground
5	+5V

J29 : 4P FAN Power Connector

PIN No.	Signal Description
1	Ground
2	+12V
3	Fan Speed Detecting signal
4	Fan Speed Control signal

J30 : LVDS Panel Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	LVDSA_DATA0	2	LVDSA_DATA0#
3	LVDSA_DATA1	4	LVDSA_DATA1#
5	LVDSA_DATA2	6	LVDSA_DATA2#
7	N/C	8	N/C
9	LVDSA_CLKP	10	LVDSA_CLKN
11	LVDSB_DATA0	12	LVDSB_DATA0#
13	LVDSB_DATA1	14	LVDSB_DATA1#
15	LVDSB_DATA2	16	LVDSB_DATA2#
17	N/C	18	N/C
19	LVDSB_CLKP	20	LVDSB_CLKN
21	LCTLB_DATA	22	LBKLT_CTL
23	Ground	24	LVDSB_DATA3#
25	Ground	26	Ground
27	VDD_LVDS	28	VDD_LVDS
29	N/C	30	VDD_LVDS

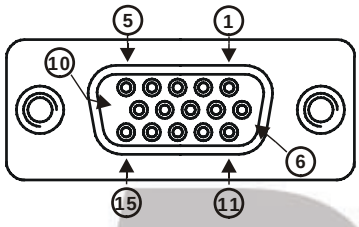
J32 : DVI Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	TMDS_DATA0-	2	TMDS_DATA0+
3	Ground	4	Ground
5	TMDS_DATA1-	6	TMDS_DATA1+
7	Ground	8	Ground
9	TMDS_DATA2-	10	TMDS_DATA2+
11	Ground	12	Ground
13	TMDS_Clock-	14	TMDS_Clock+
15	+5V	16	+5V
17	DVI DDC DATA	18	DVI DDC CLOCK
19	HPDET	20	N/C

J33/J34 : Serial Port-1/Port-2 Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request to Send (RTS)
5	Transmit Data (TXD)	6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	GND	10	NC

J35 : D-SUB15 VGA Connector



PIN No.	Signal Description	PIN No.	Signal Description
1	RED	2	GREEN
3	BLUE	4	ID0
5	Ground	6	Ground
7	Ground	8	Ground
9	NC	10	Ground
11	ID1	12	DDCDATA
13	HSYNC	14	VSYNC
15	DDCCLK		

J36 : ATX Standby Power Connector

PIN No.	Signal Description
4	ATX Power OK
3	ATX_5VSB
2	PS ON
1	GND

Chapter 3
System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle WDT operation in software programming.

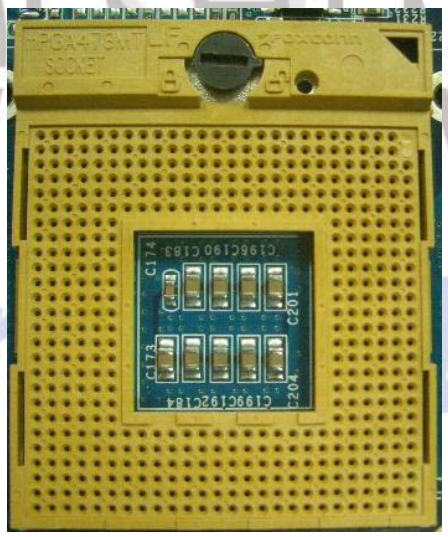
3.1 Yonah/Merom Processor

Configuring System Bus

BLUEBOARD will automatically detect the CPU used. Support Package µFCPGA479 LV Yonah Dual Core processor CPU.

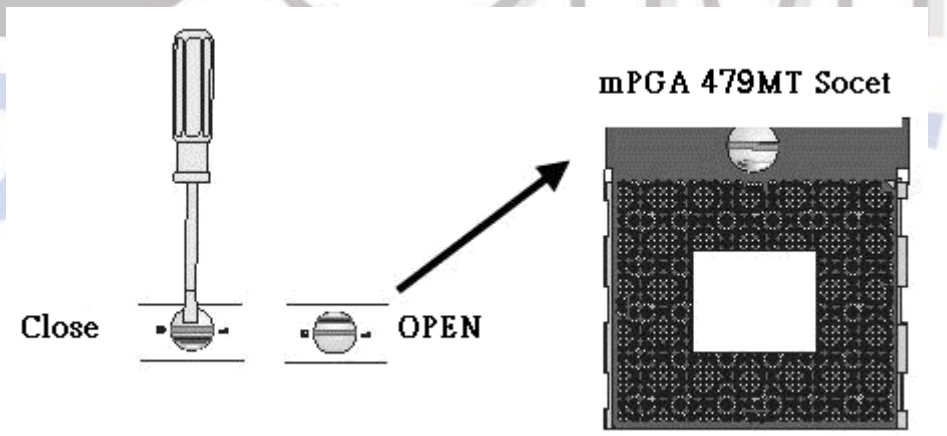
Installing mPGA 479MT Socket

1) Lift the handling lever of CPU socket outwards and upwards to the other end.



2) Align the processor pins with pinholes on the socket. Make sure that the notched corner or dot mark (pin 1) of the CPU corresponds to the socket's bevel end. Then press the CPU gently until it fits into place. If this operation is not easy or smooth, don't do it forcibly. You need to check and rebuild the CPU pin uniformly.

3) Push down the lever to lock processor chip into the socket once CPU fits.



To un-install the current processor, use a screwdriver to disengage (open) the socket actuator, as shown in Figure 1 below. The socket actuator should open after only a half turn or so, and you should then be able to remove the processor with your fingers.

J1 : ATX4, 12V POWER CON.

PIN No.	Signal Description
1	Ground
2	Ground
3	+12V
4	+12V

Removing CPU

1) Unlock the cooling fan first.
2) Lift the lever of CPU socket outwards and upwards to the other end.
3) Carefully lifts up the existing CPU to remove it from the socket.
4) Follow the steps of installing a CPU to change to another one or place handling bar to close the opened socket.

3.2 Main Memory

BLUEBOARD provides 2 x 240-pin DDR2-SDRAM DIMM sockets support 1.8V dual-channel DDR2 667/533/400 and non ECC memory as Smallest memory capacity possible is 128MB on-board main memory. Largest memory capacity possible is 4GB (2GB per channel). Memory clock Auto detecting to BIOS CMOS settings.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install your DRAM module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

Dual Channel DDR2 SODIMM

Dual Channel DDR2 memory technology doubles the bandwidth of memory bus. Adequate or higher bandwidth of memory than processor would increase system performance. To enable Dual Channel DDR2 memory technology, you have to install dual identical memory modules in both memory sockets. Following tables show bandwidth information of different processor and memory configurations.

Memory Frequency	Dual Channel DDR Bandwidth	Single Channel DDR Bandwidth
667MHz	10.2 GB/s	5.3GB/s
533 MHz	8.5 GB/s	4.2GB/s

Note:
To maintain system stability, don't change any of DRAM parameters in BIOS setup to upgrade your system performance without acquiring technical information.

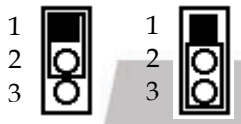
CPU FSB / Memory Frequency synchronization

Support different memory frequencies depending on the CPU front side bus and the type of DDR2 SDRAM.

CPU FSB	Memory Frequency
667 MHz	400MHZ / 533 MHZ / 667 MHz
533 MHz	400 MHZ / 533 MHz

3.3 Clear CMOS Operation

The following table indicates how to enable/disable CMOS Clear Function hardware circuit by putting jumpers at proper position.



Normal Clear

JP7	Function
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS contents

3.4 WDT Function

The working algorithm of the WDT function can be simply described as a counting process. The Time-Out Interval can be set through software programming. The availability of the time-out interval settings by software or hardware varies from boards to boards.

BLUEBOARD allows users control WDT through dynamic software programming. The WDT starts counting when it is activated. It sends out a signal to system reset, when time-out interval ends. To prevent the time-out interval from running out, a re-trigger signal will need to be sent before the counting reaches its end. This action will restart the counting process. A well-written WDT program should keep the counting process running under normal condition. WDT should never generate a system reset unless the system runs into troubles.

The related Control Registers of WDT are all included in the following sample program that is written in C language. User can fill a non-zero value into the Timeout Value Register to enable/refresh WDT. System will be reset after the Time-out Value to be counted down to zero. Or user can directly fill a zero value into Time-out Value Register to disable WDT immediately. To ensure a successful accessing to the content of desired Control Register, the sequence of following program codes should be step-by-step run again when each register is accessed.

Additionally, there are maximum 2 seconds of counting tolerance that should be considered into user' application program. For more information about WDT, please refer to Winbond W83627THF data sheet.

There are two PNP I/O port addresses that can be used to configure WDT,

1) 0x2E:EFIR (Extended Function Index Register, for identifying CR index number)
2) 0x2F:EFDR (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of WDT.

```
// Enter Extended Function Mode
outp(0x002E, 0x87);
outp(0x002E, 0x87);
// Assign Pin 89 to be a WDTO
outp(0x002E, 0x2B);
outp(0x002F, inp(0x002F) & 0xEF);
// Select Logic Device 8
outp(0x002E, 0x07);
outp(0x002F, 0x08);
// Active Logic Device 8
outp(0x002E, 0x30);
outp(0x002F, 0x01);
// Select Count Mode
outp(0x002E, 0xF5);
outp(0x002F, (inp(0x002F) & 0xF7) | ( Count-mode Register & 0x08));
// Specify Time-out Value
outp(0x002E, 0xF6);
outp(0x002F, Time-out Value Register );
// Disable WDT reset by keyboard/mouse interrupts
outp(0x002E, 0xF7);
outp(0x002F, 0x00);
// Exit Extended Function Mode
outp(0x002E, 0xAA);
```

Definitions of Variables:
Value of Count-mode Register :
1) 0x00 -- Count down in seconds (Bit3=0)
2) 0x08 -- Count down in minutes (Bit3=1)
Value of Time-out Value Register :
1) 0x00 -- Time-out Disable
2) 0x01~0xFF -- Value for counting down

3.5 GPIO

BLUEBOARD provides 8 programmable input or output ports that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of I/O Selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.

J18 : 8-Bit GPIO Header

PIN No.	Signal Description
1	Ground
2	Ground
3	GPIO0
4	GPIO4
5	GPIO1
6	GPIO5
7	GPIO2
8	GPIO6
9	GPIO3
10	GPIO7
11	+5V
12	+12V

All General Purpose I/O ports can only apply to standard TTL ± 5% signal level (0V/5V), and each source sink capacity up to 12mA.

BLUEBOARD GPIO Programming Guide

There are 8 GPIO pins on BLUEBOARD. These GPIO pins are from SUPER I/O (W83627THF) GPIO pins, and can be programmed as Input or Output direction. J18 pin header is for 8 GPIO pins and its pin assignment as following :

J18_Pin3=GPIO0:from SUPER I/O_GP10 with Ext. 2.7K PH
J18_Pin4=GPIO4:from SUPER I/O_GP14 with Ext. 2.7K PH
J18_Pin5=GPIO1:from SUPER I/O_GP11 with Ext. 2.7K PH
J18_Pin6=GPIO5:from SUPER I/O_GP15 with Ext. 2.7K PH
J18_Pin7=GPIO2:from SUPER I/O_GP12 with Ext. 2.7K PH
J18_Pin8=GPIO6:from SUPER I/O_GP16 with Ext. 2.7K PH
J18_Pin9=GPIO3:from SUPER I/O_GP13 with Ext. 2.7K PH
J18_Pin10=GPIO7:from SUPER I/O_GP17 with Ext. 2.7K PH

<<<<< **Be careful Pin1&2=GND , Pin11=5V , Pin12=12V** >>>>>

There are several Configuration Registers (CR) of W83627THF needed to be programmed to control the GPIO direction, and status(GPI)/value(GPO). CR02h ~ CR2F are common (global) registers to all Logical Devices (LD) in W83627THF. CR07h contains the Logical Device Number that can be changed to access the LD as needed. LD7 contains the GPIO10~17 registers.

Programming Guide:
Step1: CR29_Bit [7.6]. P [0,1]; to select multiplexed pins as GPIO10~17 pins
Step2: CR07h.P [07h]; Point to LD7
Step3: LD7_CR30h_Bit0.P1; Enable LD7
Step4: Select GPIO direction, Get Status or output value.

LD7_CRF0h; GPIO17 ~ 10 direction, 1 = input, 0 = output pin
LD7_CRF2h.P[00h]; Let CRF1 (GPIO data port) non-invert to prevent from confusion
LD7_CRF1h; GPIO17~10 data port, for input pin, get status from the related bit, for output pin, write value to the related bit.

For example,
LD7_CRF0h_Bit4.P0; Let GPIO14 as output pin
LD7_CRF2h_Bit4.P0; Let CRF1_Bit4 non-inverted
LD7_CRF1h_Bit4.P0; Output "0" to GPIO14 pin (J18_Pin4)
LD7_CRF0h_Bit0.P1; Let GPIO10 as input pin
LD7_CRF2h_Bit0.P0; Let CRF1_Bit0 non-inverted
Read LD7_CRF1h_Bit0; Read the status from GPIO10 pin (J18_Pin3)

How to access W83627THF CR?
In BLUEBOARD, the EFER = 002Eh, and EFDR = 002Fh.
EFER and EFDR are 2 IO ports needed to access W83627THF CR.
EFER is the Index Port, EFDR is the Data Port.

CR index number needs to be written into EFER first. Then the data will be read/written from/to EFDR. To R/W W83627THF CR, it is needed to Enter/Enable Configuration Mode first. When completing the programming, it is suggested to Exit/Disable Configuration Mode.

Enter Configuration Mode: Write 87h to IO port EFER twice.
Exit Configuration Mode: Write AAh to IO port EFER.

Example
Define GPIO4 as output pin, and output "0" to this pin.

```
mov dx,2eh ; Enter Configuration Mode
mov al,87h
out dx,al
jmp $+2
out dx,al
mov dx,2eh
mov al,29h ; Read CR29
out dx,al
mov dx,2fh
in al,dx
and al,3Fh
or al,40h ; CR29_Bit[7..6].P[0,1]
mov ah,al
mov dx,2eh
mov al,2Ah
out dx,al
mov dx,2fh
mov al,ah
out dx,al

mov dx,2eh
mov al,07h ; Point to LDN7
out dx,al
mov dx,2fh
mov al,07h
out dx,al
mov dx,2eh ; Read CR30
mov al,30h
out dx,al
```

```
mov dx,2fh
in al,dx
or al,01h
mov ah,al
mov dx,2eh ; CR30_Bit0.P1
mov al,30h
out dx,al
mov dx,2fh
mov al,ah
out dx,al

mov dx,2eh
mov al,0f0h ; Read LD7_CRF0
out dx,al
mov dx,2fh
in al,dx
and al,0efh
mov ah,al
mov dx,2eh
mov al,0f0h ; LD7_CRF0_Bit4.P0
out dx,al
mov dx,2fh
mov al,ah
out dx,al
mov dx,2eh
mov al,0f2h ; Read LD7_CRF2
out dx,al
mov dx,2fh
in al,dx
and al,0efh
mov ah,al
mov dx,2eh
mov al,0f2h ; LD7_CRF2_Bit4.P0
out dx,al
mov dx,2fh
mov al,ah
out dx,al
```

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```
mov dx,2eh
mov al,0f1h ; Read LD7_CRF1
out dx,al
mov dx,2fh
in al,dx
and al,0efh
mov ah,al
mov dx,2eh
mov al,0f1h ; LD7_CRF1_Bit4.P0
out dx,al
mov dx,2fh
mov al,ah
out dx,al

mov dx,2eh ; Exit Configuration Mode
mov al,0AAh
out dx,al
```

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Chapter 4
BIOS Setup Information

BLUEBOARD is equipped with the AWARD BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, BLUEBOARD communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start-up.

4.1 Entering Setup

Turn on or reboot the computer. The message "Hit <DEL> if you want to run SETUP" appears, press <Del> key immediately to enter BIOS setup program.

If the message disappears before you respond, but you still wish to enter Setup, please restart the system to try "COLD START" again by turning it OFF and then ON, or touch the "RESET" button. You may also restart from "WARM START" by pressing <Ctrl>, <Alt>, and <Delete> keys simultaneously. If you do not press the keys at the right time and the system will not boot, an error message will be displayed and you will again be asked to,

Press <F1> to Run SETUP or Resume

In HIFLEX BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table below will show you all of keystroke functions in BIOS setup.

General Help	
↑ ↓ → ←	: Move
Enter	: Select
+ / - /PU /PD	: Value
ESC	: Exit
F1	: General Help
F2	: Item Help
F5	: Previous Values
F6	: Fail-Safe Defaults
F7	: Optimized Defaults
F9	: Menu in BIOS
F10	: Save

4.2 Main Menu

Once you enter BLUEBOARD AWARD BIOS CMOS Setup Utility, you should start with the Main Menu. The Main Menu allows you to select from eleven setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> key to accept or bring up the sub-menu.

Phoenix- AwardBIOS CMOS Setup Utility

▶ Standard CMOS Features ▶ Advanced BIOS Features ▶ Advanced Chipset Features ▶ Integrated Peripherals ▶ Power Management Setup ▶ PnP/PCI Configurations ▶ PC Health Status	▶ Frequency/Voltage Control Load Fail-Safe Defaults Load Optimized Defaults Set Supervisor Password Set User Password Save & Exit Setup Exit Without Saving
ESC : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item
Time, Date, Hard Disk Type …	

Note:
It is strongly recommended to reload Optimal Setting if CMOS is lost or BIOS is updated.

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4.3 Standard CMOS Setup Menu

This setup page includes all the items in standard compatible BIOS. Use the arrow keys to highlight the item and then use the <PgUp>/<PgDn> or <+>/<-> keys to select the value or number you want in each item and press <Enter> key to certify it.

Follow command keys in CMOS Setup table to change Date, Time, Drive type, and Boot Sector Virus Protection Status.

Phoenix- AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Mon, Jul 3 2006	Item Help
Time (hh:mm:ss)	15 : 19 : 30	
▶ IDE Channel 0 Master	[None]	Menu Level ▶
▶ IDE Channel 0 Slave	[None]	
▶ IDE Channel 1 Master	[None]	Change the day, month, year and century
▶ IDE Channel 1 Slave	[None]	
Drive A	[1.44M, 3.5 in.]	
Drive B	[None]	
Video	[EVG/VGA]	
Halt On	[All, But Keyboard]	
Base Memory	*640K*	
Extended Memory	*514048K*	
Total Memory	*515072K*	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Note:
Oblique items are base on memory capacity which user adopts on single board.

■ **Menu Selections**

Item	Options	Description
Date	mm:dd:yy	Change the day, month, year and century
Time	hh:mm:ss	Change the internal clock
IDE Channel 0 Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 0 Slave	Options are in its sub menu	Press <Enter> to enter the next page for detail hard drive settings
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Press <Enter> to enter the next page for detail hard drive settings
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	640K	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

4.4 IDE Adaptors Setup Menu

The IDE adapters control the IDE devices, such as Hard disk drive or CDROM drive. It uses a separate sub menu to configure each hard disk drive.

Phoenix- AwardBIOS CMOS Setup Utility
IDE Channel 0 Master

IDE HDD Auto-Detection	[Press Enter]	Item Help
IDE Channel 0 Master	[Auto]	Menu Level ▶
Access Mode	[Auto]	
Capacity	10246 MB	To auto-detect the HDD's size, head … on this channel
Cylinder	19852	
Head	16	
Precomp	0	
Landing Zone	19851	
Sector	63	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

■ **Menu Selections**

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Channel 0 Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE!
Access Mode	CHS, LBA Large, Auto	Choose the access mode for this hard disk
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk-checking program.
The following options are selectable only if the 'IDE Channel 0 Master' item is set to 'Manual'		

Cylinder	Min = 0, Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0, Max = 255	Set the number of read/write heads
Precomp	Min = 0, Max = 65535	**** Warning: Setting a value of 65535 means no hard disk
Landing zone	Min = 0, Max = 65535	****
Sector	Min = 0, Max = 255	Number of sectors per track

4.5 Advanced BIOS Feature

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

Phoenix- AwardBIOS CMOS Setup Utility
Advanced BIOS Features

▶ CPU Feature	[Press Enter]	Item Help
▶ Hard Disk Boot Priority	[Press Enter]	
Virus Warning	[Disabled]	Menu Level ▶
CPU L1 & L2 Cache	[Enabled]	
CPU L3 Cache	[Enabled]	
Quick Power On Self Test	[Enabled]	
First Boot Device	[Hard Disk]	
Second Boot Device	[CDROM]	
Third Boot Device	[LS120]	
Boot Other Device	[Enabled]	
Swap Floppy Drive	[Disabled]	
Boot Up Floppy Seek	[Enabled]	
Boot Up NumLock Status	[On]	
Gate A20 Option	[Fast]	
Typematic Rate Setting	[Disabled]	
X Typematic Rate (Chars/Sec)	6	
X Typematic Delay (Msec)	250	
Security Option	[Setup]	
APIC Mode	[Enabled]	
MPS Version Control For OS	[1.4]	
OS select for DRAM>64MB	[Non-0S2]	
Report No FDD For WIN 95	[No]	
Full Screen LOGO Show	[Disabled]	
Small Logo(EPA) Show	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

4.6 CPU Feature

Phoenix- AwardBIOS CMOS Setup Utility
CPU Feature

Delay Prior to Thermal	[16 Min]	Item Help
C1E Function	[Auto]	
Execute Disabled Bit	[Enabled]	Menu Level ▶
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

Delay Prior to Thermal

The choice: 4 Min, 8 Min, 16 Min, and 32 Min.

C1E Function

Select Auto or disabled CPU C1E Function.

The choice: Auto, Disabled.

Execute Disabled Bit

When disabled, forces the XD feature flag to always return 0.

Execute Disable Bit currently requires one of the following operating systems to support it: OS: Windows* Server 2003 with SP 1 / Windows* XP* with SP 2 / SUSE Linux* 9.2 / Red Hat Enterprise Linux 3 Update 3.

The choice: Enabled, Disabled.

4.7 Hard Disk Boot Priority

Phoenix- AwardBIOS CMOS Setup Utility
Hard Disk Boot Priority

1. ch0 M. : Maxtor 91021U2 2. ch2 M. : ST3120827AS 3. ch3 M. : ST3120827AS 4. Bootable add-in Cards	Item Help Menu Level ▶ Use < ↑ > or < ↓ > to select a device, then press <+> to move it up, or <-> to move it down the list. Press <ESC> to exit this menu.
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults	

Hard Disk Boot Priority

Select Hard Disk Boot Device Priority. Use < ↑ > or < ↓ > to select a device, then press <+> to move it up, or <-> to move it down the list. Press <ESC> to exit this menu.

Bootable Add-in Cards	Select SCSI Boot

Virus Warning

Allow you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

CPU L1 Cache/L2 Cache

These two categories speed up memory access. However, it depends on CPU/chipset design.

Enabled	Enable Cache
Disabled	Disable Cache

CPU L3 Cache

These two categories speed up memory access. However, it depends on CPU/chipset design.

Enabled	Enable Cache
Disabled	Disable Cache

Quick Power On Self Test

The system to skip certain tests while booting. This will decrease the time needed to boot the system.

Enabled	Enable quick POST
Disabled	Normal POST

First/Second/Third Boot Device

Select your boot device priority.

The choice: Floppy, LS120, Hard Disk, CDROM, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, LAN and Disabled.

Boot Other Device

Select your boot device priority.

The choice: Enabled, Disabled.

Swap Floppy Drive

If the system has two floppy drives, choose enable to assign physical driver B to logical drive A and Vice-Versa.

The choice: Enabled, Disabled.

Boot Up Floppy Seek

Enabled tests floppy drives to determine whether they have 40 or 80 tracks.

The choice: Enabled, Disabled.

Boot Up NumLock Status

Select power on state for NumLock.

The choice: Off, On.

Gate A20 Option

Fast-lets chipsets control Gate A20 and Normal – a pin in the keyboard controller controls Gate A20. Default is Fast.

The choice: Normal, Fast.

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller – When enabled, the typematic rate and typematic delay can be selected.

The choice: Enabled, Disabled.

Typematic Rate (Chars/sec)

The rate at character repeats when you hold down a key.

The choice: 6, 8, 10, 12, 15, 20, 24, and 30.

Typematic delay (Msec)

The delay before keystrokes begins to repeat.

The choice: 250, 500, 750, and 1000.

Security Option

Select whether the password is required every time the system boots or only when you enter setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

APIC Mode

Setting to Enabled can cause instabilities. Once the operating system is installed, such as Windows XP in my case, this setting cannot be changed without reinstalling the operating system, regardless of whether the initial setting is Disabled or Enabled. The purpose of setting it to Enabled is to extend the number of IRQ's, which sounds like a real risky proposition. I'm not surprised to see the conclusion reached at APIC: Benefit or Trouble. The number of IRQ's should be fine without being extended, anyway.

The choice: Enabled, Disabled.

MPS Version Control For OS

Not changeable with APIC Mode set to disabled.

The choice: 1.1, 1.4.

OS Select For DRAM > 64MB

Select OS/2 only if you are running OS/2 operating system with greater than 64MB of RAM on the system.

The choice: Non-OS2, OS2.

Report No FDD for WIN 95

The choice: No, Yes.

Full Screen LOGO Show

The choice: Enabled, Disabled.

Small Logo (EPA) Show

The choice: Enabled, Disabled.

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4.8 Advanced Chipset Feature

This section allows you to configure the system based on the specific features of the Intel 945GM chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM (DDR II SO-SDRAM) and the external cache. It also coordinates communications between the conventional PCI Express bus and PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

Phoenix- AwardBIOS CMOS Setup Utility
Advanced Chipset Features

DRAM Timing Selectable	[By SPD]	Item Help
X CAS Latency Time	Auto	
X DRAM RAS# to CAS# Delay	Auto	Menu Level ▶
X DRAM RAS# Precharge	Auto	
X Precharge delay (tRAS)	Auto	
X System Memory Frequency	Auto	
SLP_S4# Assertion Width	[1 to 2 Sec.]	
System BIOS Cacheable	[Enabled]	
Video BIOS Cacheable	[Disabled]	
Memory Hole At 15M-16M	[Disabled]	
▶ PCI Express Root Port Func	[Press Enter]	
** VGA Setting **		
PEG/Onchip VGA Control	[Auto]	
On-Chip Frame Buffer Size	[8MB]	
DVMT Mode	[DVMT]	
DVMT /FIXED Memory Size	[128MB]	
Boot Display	[Auto]	
Panel Scaling	[Auto]	
Panel Number	[640X480 18bit 1ch]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

DRAM Timing Selectable

This option provides DIMM plug-and-play support by serial presence detect (SPD) mechanism via the system management bus (SMBUS) interface.

The choice: Manual, By SPD.

CAS Latency Time

This option controls the number of SCLKs between the time a read command is sampled by the DRAMs and the time the GMCH samples correspondent data from the DRAMs.

The choice: 3, 4, 5, 6, and Auto.

DRAM RAS# to CAS# Delay

This option controls the number of SCLKs (SDRAM Clock) from a row activate command to a read or write command. If your system installs good quality of SDRAM, you can set this option to "3 SCLKs" to obtain better memory performance. Normally, the option will be set to Auto.

The choice: 2, 3, 4, 5, 6, and Auto.

DRAM RAS# Precharge

This option controls the number of SCLKs for RAS# precharge. If your system installs good quality of SDRAM, you can set this option to "3 SCLKs" to obtain better memory performance. It is set to auto normally.

The choice: 2, 3, 4, 5, 6, and Auto.

Precharge delay (tRAS)

The choice: 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and Auto.

System Memory Frequency

Users are recommended to use Auto for memory frequency selection.

The choice: 533MHz, 667MHz, and Auto.

SLP_S4# Assertion Width

The choice: 4 to 5 Sec., 3to 4 Sec, 2 to 3 Sec., 1 to 2 Sec.

System BIOS Cacheable

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

The choice: Enabled, Disabled.

Video BIOS Cacheable

Select "Enabled" to enable caching VGA BIOS into L2 cache to get higher display performance. Select "Disabled" to ignore this BIOS caching function.

The choice: Enabled, Disabled.

Memory Hole At 15-16M

In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB.

The choice: Enabled, Disabled.

Phoenix- AwardBIOS CMOS Setup Utility
PCI Express Root Port Func

PCI Express Port 1	[Auto]	Item Help
PCI Express Port 2	[Auto]	
PCI Express Port 3	[Auto]	Menu Level ▶
PCI Express Port 4	[Auto]	
PCI Express Port 5	[Auto]	
PCI Express Port 6	[Auto]	
PCI-E Compliancy Mode	[V1.0a]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

PCI Express Port 1 / Port 2 / Port 3 / Port 4 / Port 5 / Port6

PCI Express Port 1 ~ Port 4 Default On-board PCI Express x 4; PCI Express Port 5 & Port 6 Default On-board Gigi LAN.

The choice: Auto, Enabled, Disabled.

PCI-E Compliancy Mode

The choice: V1.0 / V1.0a.

PEG/Onchip VGA Control

The choice: Onchip VGA, PEG Port, and Auto.

On-Chip Frame Buffer Size

The choice: 1MB, 8MB.

DVMT Mode

The choice: DVMT, FIXED and BOTH.

DVMT /FIXED Memory Size

The choice: 64MB, 128MB, 224MB.

Boot Display

The choice: Auto, CRT, LVDS, CRT+LVDS, DVI, CRT+DVI.

Panel Scaling

The choice: Auto, On, Off.

Panel Number

The choice: 640X480 18bit 1ch, 800X600 18bit 1ch, 1024X768 18bit 1ch, 1024X768 24bit 1ch, 1280X768 24bit 1ch, 1280X1024 24bit 2ch, 1400X1050 18bit 2ch, and 1600X1200 24bit 2ch.

4.9 Integrated Peripherals

Phoenix- AwardBIOS CMOS Setup Utility
Integrated Peripherals

▶ OnChip IDE Device	[Press Enter]	Item Help
▶ Onboard Device	[Press Enter]	
▶ Super IO Device	[Press Enter]	Menu Level ▶
Onboard LAN Boot ROM init	[Disabled]	
Mini PCI Function	[Enabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Onboard LAN Boot ROM init

Select "Enabled" to Onboard Load Boot ROM to shadow RAM.

The choice: Enabled, Disabled.

Mini PCI Function

The choice: Enabled, Disabled.

Phoenix- AwardBIOS CMOS Setup Utility
OnChip IDE Device

IDE HDD Block Mode	[Enabled]	Item Help
IDE DMA transfer access	[Enabled]	
On-Chip Primary PCI IDE	[Enabled]	Menu Level ▶
IDE Primary Master PIO	[Auto]	
IDE Primary Slave PIO	[Auto]	If you're IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.
IDE Primary Master UDMA	[Auto]	
IDE Primary Slave UDMA	[Auto]	
On-Chip Secondary PCI IDE	[Enabled]	
IDE Secondary Master PIO	[Auto]	
IDE Secondary Slave PIO	[Auto]	
IDE Secondary Master UDMA	[Auto]	
IDE Secondary Slave UDMA	[Auto]	
*** On-Chip Serial ATA Setting ***		
X SATA Mode	IDE	
On-Chip Serial ATA	[Auto]	
X SATA PORT Speed Settings	Disabled	
X PATA IDE Mode	Secondary	
SATA Port	P0, P2 is Primary	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

IDE HDD Block Mode

If you're IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

The choice: Enabled, Disabled.

IDE DMA transfer access

The choice: Enabled, Disabled.

On-Chip Primary/ Secondary PCI IDE

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface.

The choice: Enabled, Disabled

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields allow set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary/Secondary Master/Slave UDMA

Ultra DMA/33/66/100 implementation is possible only if IDE hard drive supports and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and system software both support Ultra DMA/33/66/100, select Auto to enable BIOS support.

The choice: Auto, Disabled.

SATA Mode

IDE	Use the Serial ATA hard disk drives as Parallel ATA physical Storage devices.
RAID	With Intel Matrix Storage Technology with RAID 0, 1 support.
AHCI	The Advanced Host Controller Interface (AHCI) specification describes the register-level interface for a Host Controller for Serial ATA 1.0a and Serial ATA II.

On-Chip Serial ATA

Disabled	Disabled SATA Controller.
Auto	Auto arrange by BIOS.
Combined Mode	PATA and SATA are combined. Max. Of 2 IDE drives in each channel.
Enhanced Mode	Enable both SATA and PATA. Max. Of 6 IDE drives are Supported.
SATA Only	SATA is operating in legacy mode.

SATA PORT Speed Settings

The choice: Disabled, Force GEN I, Force GEN II.

Phoenix- AwardBIOS CMOS Setup Utility
Onboard Device

USB Controller	[Enabled]	Item Help
USB 2.0 Controller	[Enabled]	
USB Keyboard Support	[Disabled]	Menu Level ▶
USB Mouse Support	[Disabled]	
AC97 Audio Select	[Auto]	
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

USB Controller

This item allows you to enable/disable USB (Universal Serial Bus) function.

The choice: Enabled, Disabled.

USB 2.0 Controller

This entry is for disable/enable EHCI controller only. This BIOS itself may/may not have high speed USB support built in, the support will be automatically turn on when high speed device were attached.

The choice: Enabled, Disabled.

USB Keyboard Support

This item allows you to enable USB keyboard function under POST, BIOS setup menu, DOS, or Windows-NT with no USB driver loaded.

The choice: Enabled, Disabled.

USB Mouse Support

This item allows you to enabled USB Mouse function under POST, BIOS Setup menu, DOS, or Window-NT with no USB driver loaded.

The choice: Enabled, Disabled.

AC97 Audio Select

Users can enable or disable on board AC97 Audio Function.

The choice: Auto, Disabled.

Phoenix- AwardBIOS CMOS Setup Utility
Super IO Device

Onboard FDC Controller	[Enabled]	Item Help
Onboard Serial Port 1	[3F8/IRQ4]	
Onboard Serial Port 2	[2F8/IRQ3]	Menu Level ▶
UART Mode Select	[Normal]	
X RxD, TxD Active	Hi, Lo	
X IR Transmission Delay	Enabled	
X UR2 Duplex Mode	Half	
X Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	[378/IRQ7]	
Parallel Port Mode	[SPP]	
X EPP Mode Select	EPP1.7	
X ECP Mode Use DMA	3	
PERON After PWR-Fail	[Off]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Onboard FDC Controller

This item allows you to enable/disable onboard Floppy disk controller.

The choice: Enabled, Disabled.

Onboard Serial Port 1/Port 2

Select an address and corresponding interrupt for the first and second serial ports.

The choice: Disabled, 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto.

UART Mode Select

This item allows users to select Infrared transmission mode.

Normal	Disable Infrared function
IrDA	Select IrDA mode transmission
ASKIR	Select ASKIR mode transmission

RxD, TxD Active

This item is to configure Infrared transmission rate. Four options are available:

Hi, Hi	High rate for receiving / High rate for transmitting
Hi, Lo	High rate for receiving / Low rate for transmitting
Lo, Hi	Low rate for receiving / High rate for transmitting
Lo, Lo	Low rate for receiving / Low rate for transmitting

IR Transmission Delay

This option will be available when IR is enabled.

The choice: Enabled, Disabled.

UR2 Duplex Mode

The available choices are full duplex mode and half duplex mode

The choice: Full, Half.

Use IR Pins

The available choices are IR-Rx2Tx2/ RxD2, TxD2.

The choice: IR-Rx2Tx2 / RxD2, TxD2.

Onboard Parallel Port

This item allows you to configure I/O address of the onboard parallel port.

The choice: Disabled, 378/IRQ7, 278/IRQ5, and 3BC/IRQ7.

Parallel Port Mode

There are four different modes for the onboard parallel port :

SPP	Switch to SPP mode
EPP	Switch to EPP mode
ECP	Switch to ECP mode
ECP + EPP	Switch to ECP + EPP mode
Normal	Switch to Normal mode

EPP Mode Select

Select different version of EPP mode.

The choice: EPP1.7, EPP1.9.

ECP Mode Use DMA

Select a proper DMA channel for ECP mode.

The choice: 1, 3.

PWRON After PWR-Fail

This item allows user to configure the power status of using ATX power supply after a serious power loss occurs.

On	System automatically restores power back
Off	System stays at power –off

4.10 Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

Phoenix- AwardBIOS CMOS Setup Utility
Power Management Setup

	ACPI Function	[Enabled]
	ACPI Suspend Type	[S3(STR)]
	Run VGABIOS if S3 Resume	[No]
	Power Management	[User Define]
	Video Off Method	[DPMS]
	Video Off In Suspend	[Yes]
	Suspend Type	[Stop Grant]
	Suspend Mode	[Disabled]
	HDD Power Down	[Disabled]
	Soft-Off by PWR-BTTN	[Instant-Off]
	Wake-up by PCI Card	[Disabled]
	Power On by Ring	[Disabled]
	USB KB Wake-Up From S3	[Disabled]
	Resume by Alarm	[Disabled]
X	Date(of Month) Alarm	0
X	Time(hh:mm:ss) Alarm	0 : 0 :0
	** Reload Global Timer Events **	
	Primary IDE 0	[Disabled]
	Primary IDE 1	[Disabled]
	Secondary IDE 0	[Disabled]
	Secondary IDE 1	[Disabled]
	COM Port	[Disabled]
	PCI PIRQ[A-D]#	[Disabled]

Item Help

Menu Level ▶

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

The choice: Enabled, Disabled.

ACPI Suspend Type

To decide which ACPI suspend mode to use.

The choice: S1(POS), S3(STR).

Run VGA BIOS if S3 Resume

The choice: Auto, Yes, No.

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to "HDD Power Down", "Suspend Mode".

There are three selections for Power Management, three of which have fixed mode settings.

Min. Power Saving	Minimum power management. Suspend Mode = 1 Hour, and HDD Power Down = 15 Min.
Max. Power Saving	Maximum power management. Suspend Mode = 1 Min., and HDD Power Down = 1 Min.
User Defined	Allow you to set each mode individually. When not disabled, Suspend Mode ranges from 1 min. to 1 Hour and HDD Power Down ranges from 1 Min. to 15 Min.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off In Suspend

This allows user to enable/disable video off in Suspend Mode.

The choice: Yes, No.

Suspend Type

Two options are available: Stop Grant and PwrOn Suspend.

The choice: Stop Grant, PwrOn Suspend.

Suspend Mode

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

The choice: Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, and 1 Hour.

HDD Power Down

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

The choice: Disabled, 1 Min, 2 Min, 3 Min, 4 Min, 5 Min, 6 Min, 7 Min, 8 Min, 9 Min, 10 Min, 11 Min, 12 Min, 13 Min, 14 Min, and 15 Min.

Soft-Off by PWR-BTTN

This item allows users to set the time to remove the power after the power button is pressed.

The choice: Instant-Off, Delay 4 Sec.

Wake-Up by PCI Card

This option can be enabled to support Wake Up by PCI LAN Card.

The choice: Disabled, Enabled.

Power On by Ring

This option can be enabled to support Wake-On-Modem signal.

The choice: Enabled, Disabled.

USB KB Wake-up From S3

This option can be enabled to support USB Keyboard in S3 mode, Wake-up System.

The choice: Enabled, Disabled.

Resume by Alarm

This item allows users to enable/disable the resume by alarm function. When "Enabled" is selected, system using ATX power supply could be powered on if a customized time and day is approached.

The choice: Enabled, Disabled.

Date(of Month) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the date parameter of the timing dateline on which to power on the system.

The choice: 0 ~ 31.

Time(hh:mm:ss) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the time parameter of the timing dateline on which to power on the system.

The choice: hh (0~23), mm (0~59), ss (0 ~59).

Primary/Secondary IDE 0/1

This item is to configure IDE devices being monitored by system so as to keep system out of suspend mode if the associated device is busy.

The choice: Enabled, Disabled.

COM Port

This item is to configure COM ports being monitored by system so as to keep system out of suspend mode if the associated device is busy.

The choice: Enabled, Disabled.

PCI PIRQ[A-D]#

This option can be used to detect PCI device activities. If they are activities, the system will go into sleep mode.

The choice: Enabled, Disabled.

4.11 PnP/PCI Configurations

This section describes configuring the PCI bus and PCI Express bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system, which allows I/O devices to operate at speeds nearing the speed the CPU itself, uses when communicating with its own special components.

This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

Phoenix- AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

Init Display First	[PCI Slot]	Item Help
Reset Configuration Data	[Disabled]	
Resources Controlled By	[Auto(ESCD)]	Menu Level ▶
X IRQ Resources	Press Enter	
PCI/VGA Palette Snoop	[Disabled]	
** PCI Express relative items **		
Maximum Payload Size	[4096]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Init Display First

This item allows you to select the first display port to be initialized.

The choice: PCI Slot, Onboard.

Reset Configuration Data

Default is disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot.

The choice: Enabled, Disabled.

Resource Controlled By

BIOS can automatically configure the entire boot and Plug and Play compatible devices. If you choose Auto, you cannot select IRQ DMA and memory base address fields, since BIOS automatically assigns them.

The choice: Auto (ESCD), Manual.

IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

Enter for more options IRQ-3/IRQ-4/IRQ-5/IRQ-7/IRQ-9/IRQ-10/IRQ-11/IRQ-12/IRQ-14/IRQ-15 assigned to.

The Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the plug and play standard whether designed for PCI or ISA bus architecture.

The choice: PCI Device / Reserved.

PCI/VGA Palette Snoop

The choice: Enabled, Disabled.

Maximum Payload Size

Set maximum TLP payload size for the PCI Express devices. The unit is byte.

The choice: 128, 256, 512, 1024, 2048, and 4096.

4.12 PC Health Status

Phoenix- AwardBIOS CMOS Setup Utility
PC Health Status

CPU Warning Temperature	[Disabled]	Item Help
Current System Temp	34℃ / 93℉	
Current CPU Temperature	33℃ / 91℉	Menu Level ▶
System Fan1 Speed	0 RPM	
CPU Fan Speed	3245RPM	
Vcore	1.16 V	
V_DDR	1.77 V	
V3.3	3.26 V	
V12	12.09 V	
VCC (V)	4.99 V	
VBAT (V)	3.20 V	
5VSB (V)	4.99 V	
Smart Fan Temperature	[60℃ / 140℉]	
Fan Tolerance Value	[5]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

CPU Warning Temperature

This item allows you to set a temperature above which the system will start the beeping warning. Default setting is disabled. This function will only with "ACPI" power management and "S3 (STR)" suspends type.

The choices : Disabled, 50℃/122℉, 53℃/127℉, 56℃/133℉, 60℃/140℉, 63℃/145 ℉, 66℃/151℉, 70℃/158℉.

Smart Fan Temperature.

The choices : Disabled, 40℃/ 104℉, 50℃/ 122℉, 60℃/140℉.

Fan Tolerance Value

The choices: 0~5.

Phoenix- AwardBIOS CMOS Setup Utility
Frequency / Voltage Control

Auto Detect PCI Clk	[Enabled]	Item Help
Spread Spectrum	[Disabled]	Menu Level ▶
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

Auto Detect PCI Clk

The choice: Enabled, Disabled.

Spread Spectrum

This item allows user to enable/disable the spread spectrum modulate.

The choice: Enabled, Disabled.

4.13 Default Menu

Selecting "Defaults" from the main menu shows you two options, which are described below

Load Fail-Safe Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N) ? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N) ? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

4.14 Supervisor/User Password Setting

You can set either supervisor or user password, or both of then. The differences between are:

Set Supervisor Password : can enter and change the options of the setup menus.

Set User Password : just can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

4.15 Exiting Selection

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit Without Saving (Y/N)? N

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

DSM® Computer

Chapter 5
Troubleshooting

This chapter provides a few useful tips to quickly get BLUEBOARD running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

CPU Installation

Due to the design of BLUEBOARD, it only supports Yonah/Merom Processor as well-known as Intel ® Core Duo Processor. Before installing Processor, please ensure the processor chosen is the right one. Regarding to processor information, please refer to Intel website

(1) Locate Pin 1 in the socket and look for a tri-angle on CPU upper interface. Math Pin and tri-angle, and then insert the CPU into the socket as Figure 5-1.

Figure 5-1

(2) After CPU is installed, please make CPU has been secure. To secure installed processor, please refer to Figure 5-2

Figure 5-2

P4 Power connector

Unlike Most Pentium-M solution motherboards, +12V CPU Supplementary Power connector is required on BLUEBOARD. It is because DSM AG wants to provide customer better performance and more reliable system. By using this CPU Supplementary will enhance the power drawing to the motherboard. However, J1, +12V CPU Supplementary Power connector must be connected all the time. Otherwise, the system will fail to boot up. Please refer to Figure 5-3 to ensure J1 connected.

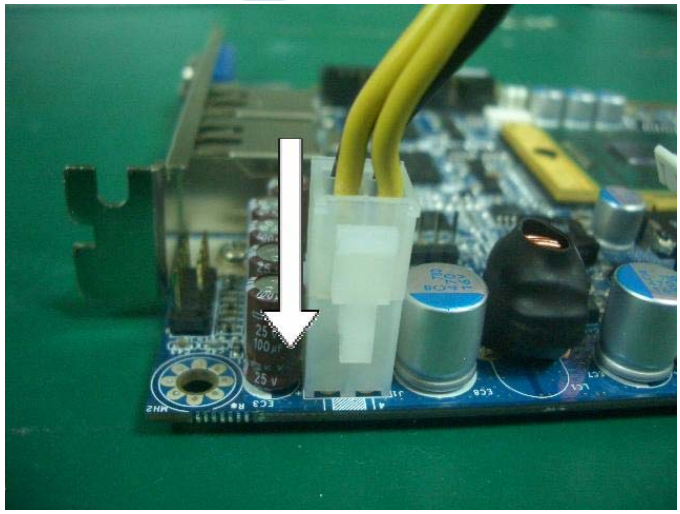


Figure 5-3

ATX Power Setting

This section would be more likely to introduce you how to set up ATX mode on your BLUEBOARD series. Please refer to the following instruction.

Step 1: Connect 20-pin power cable of the ATX POWER with ATX POWER CONNECTOR (20-pin) on the backplane. (Figure 5-4)

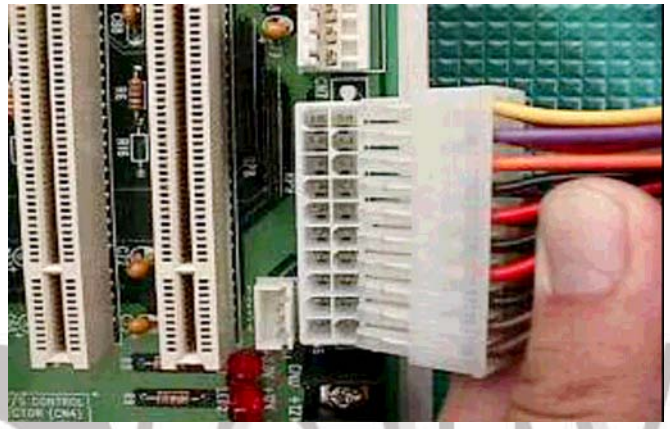


Figure 5-4

Step 2: Use 4-pin power cable to connect both ATX P/S Control Connector on backplane and ATX Power Control (J36) on Signal Board Computer. (Figure5-5)

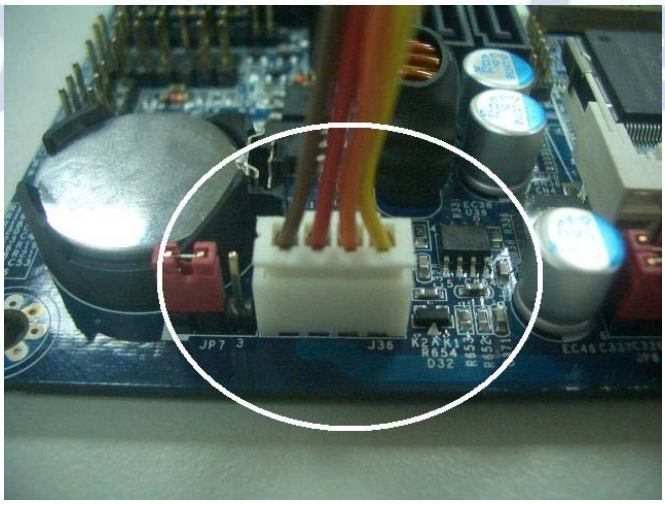


Figure 5-5

Step 3: Please adjust AT/ATX Jumper on JP6 to short 3-5, 4-6 pins, then it can support ATX power scheme. (Figure 5-6)

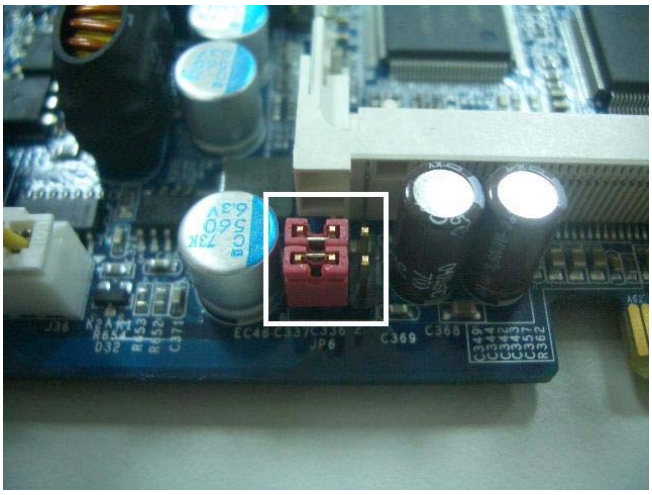


Figure 5-6

Step 4: Please connect 12V Power to CPU supplementary Power Connector (J28), which shows on Figure 5-3.

Step 5: Connect TOGGLE SWITCH with J20 connector on BLUEBOARD series (Figure 5-7), which is used to power on ATX Power Supply. Generally, the TOGGLE SWITCH is located on the chassis of front panel.

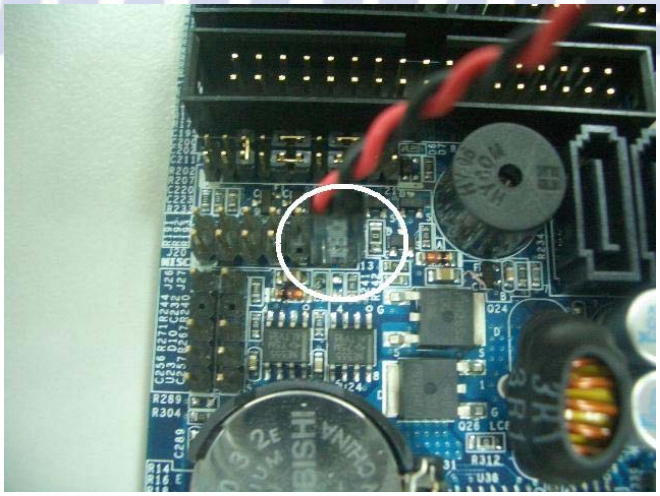


Figure 5-7

AT Power Setting

This section will introduce you how to quickly and appropriately set up AT power on your system.

Step 1: Please adjust AT/ATX Jumper on JP6 to short 1-3, 2-4 pins, then it can support AT power scheme. (Figure 5-8)

Figure 5-8

Note:
If current Power setting is at ATX mode, please clean CMOS first before adjusting Power setting to AT mode. Otherwise, system would not boot up properly.

Step 2: Remove 4 pins power cable, and then put a jumper back on pin 3 (PS-ON) and pin 4 (GND) of backplane ATX P/S control connector. (Figure 5-9)

Figure 5-9

Serial ATA Hardware and SATA RAID Installation

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time; there are total two connectors, J16 and J17. The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation. All you need to do is to plug in two cables and enable SATA in System BIOS. (The Serial ATA hard disk of installation, please see figure 5-10 as a below)

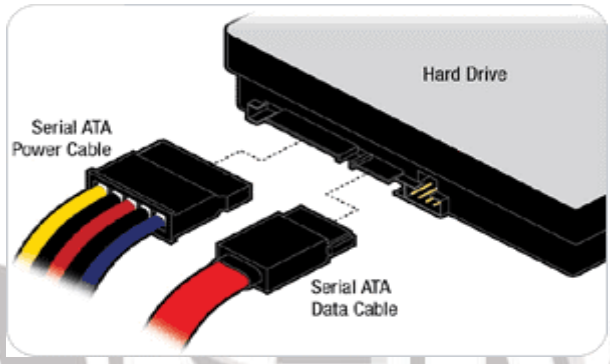


Figure 5-10

After done with the installation of SATA hardware, please enter system BIOS to enable Serial ATA function. Otherwise, Serial hardware won't be recognized. To enable SATA function, please see as following:

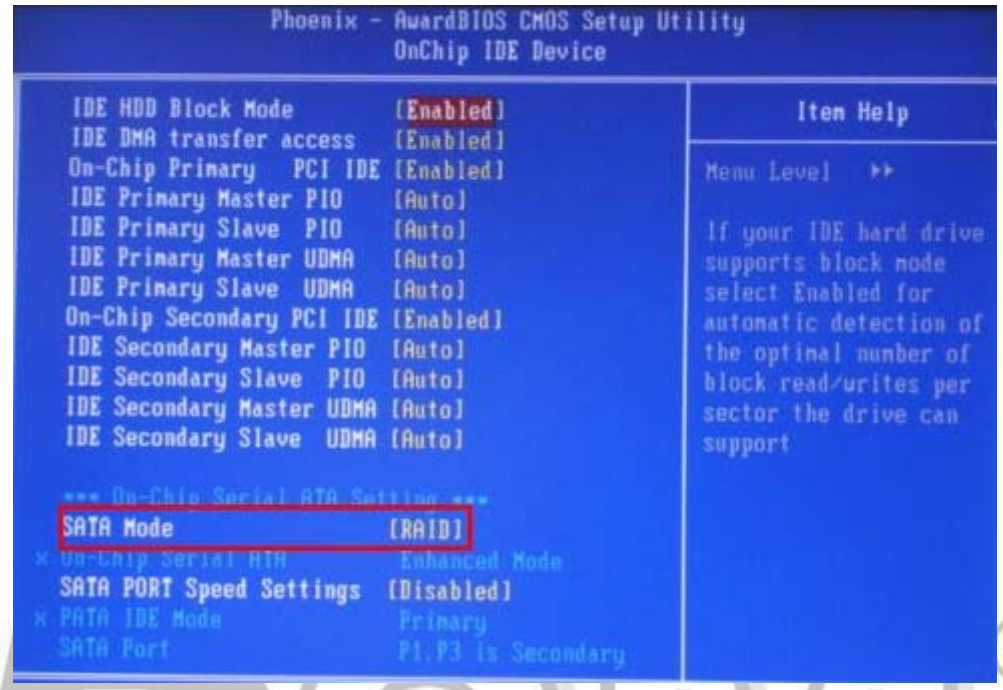
System BIOS

Integrated Peripherals

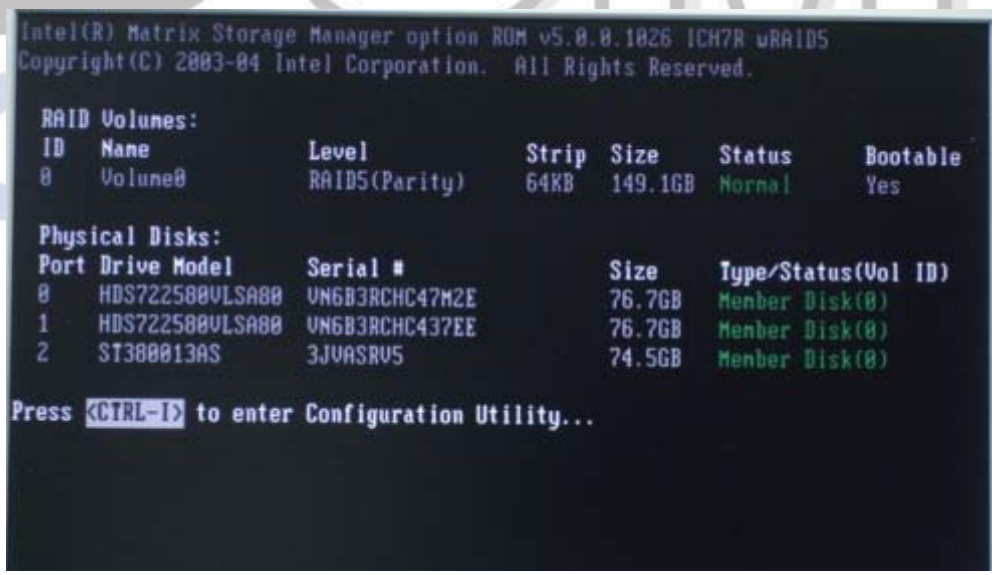
On Chip IDE Device …… [Press enter]

On-Chip Serial ATA…… [Auto]

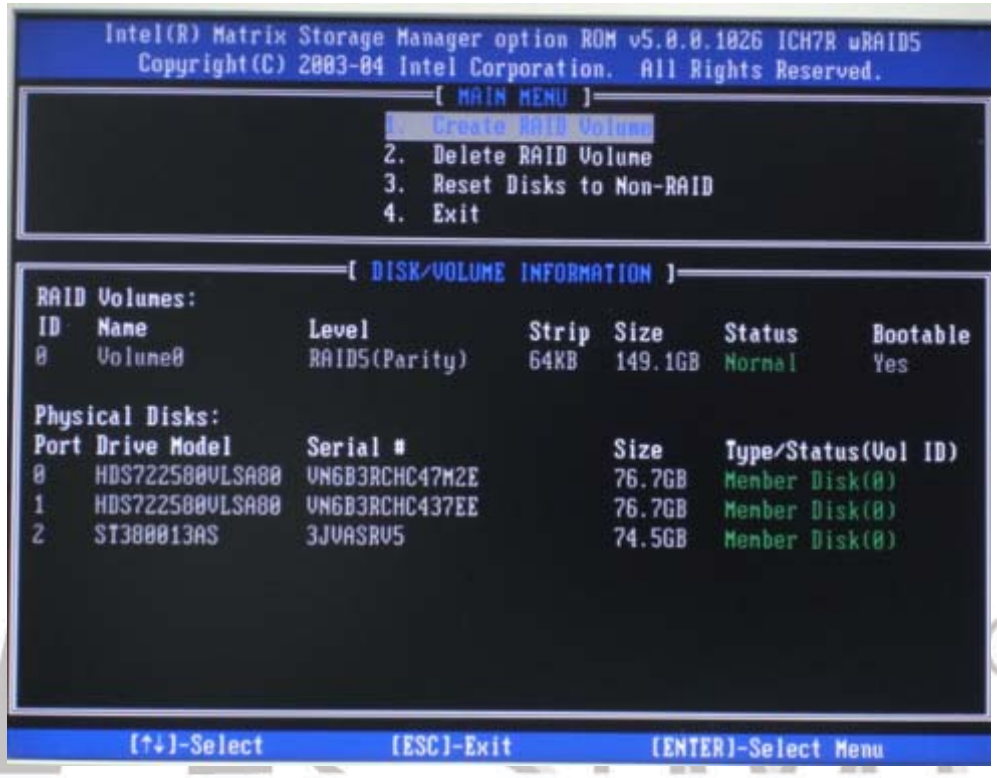
Besides, BLUEBOARD also supports RAID 0 and 1 functions. To enable SATA RAID function, On-Chip Serial ATA must be set to "**Enhanced Mode**". After that, SATA Mode option will be unmasked automatically. Please set SATA Mode from "**IDE"** to **"RAID"**, and then save reboot system after saving the new setting. Please refer to the following picture.


Phoenix - AwardBIOS CMOS Setup Utility
OnChip IDE Device
IDE HDD Block Mode [Enabled]
IDE DMA transfer access [Enabled]
On-Chip Primary PCI IDE [Enabled]
IDE Primary Master PIO [Auto]
IDE Primary Slave PIO [Auto]
IDE Primary Master UDMA [Auto]
IDE Primary Slave UDMA [Auto]
On-Chip Secondary PCI IDE [Enabled]
IDE Secondary Master PIO [Auto]
IDE Secondary Slave PIO [Auto]
IDE Secondary Master UDMA [Auto]
IDE Secondary Slave UDMA [Auto]
SATA Mode [RAID]
SATA PORT Speed Settings [Disabled]
Item Help
Menu Level ▸▸
If your IDE hard drive supports block node select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support

After rebooting system, you will see the RAID Configuration Utility appear during the post stage. However, to enter RAID Configuration Utility, please press "<CTRL+I>"

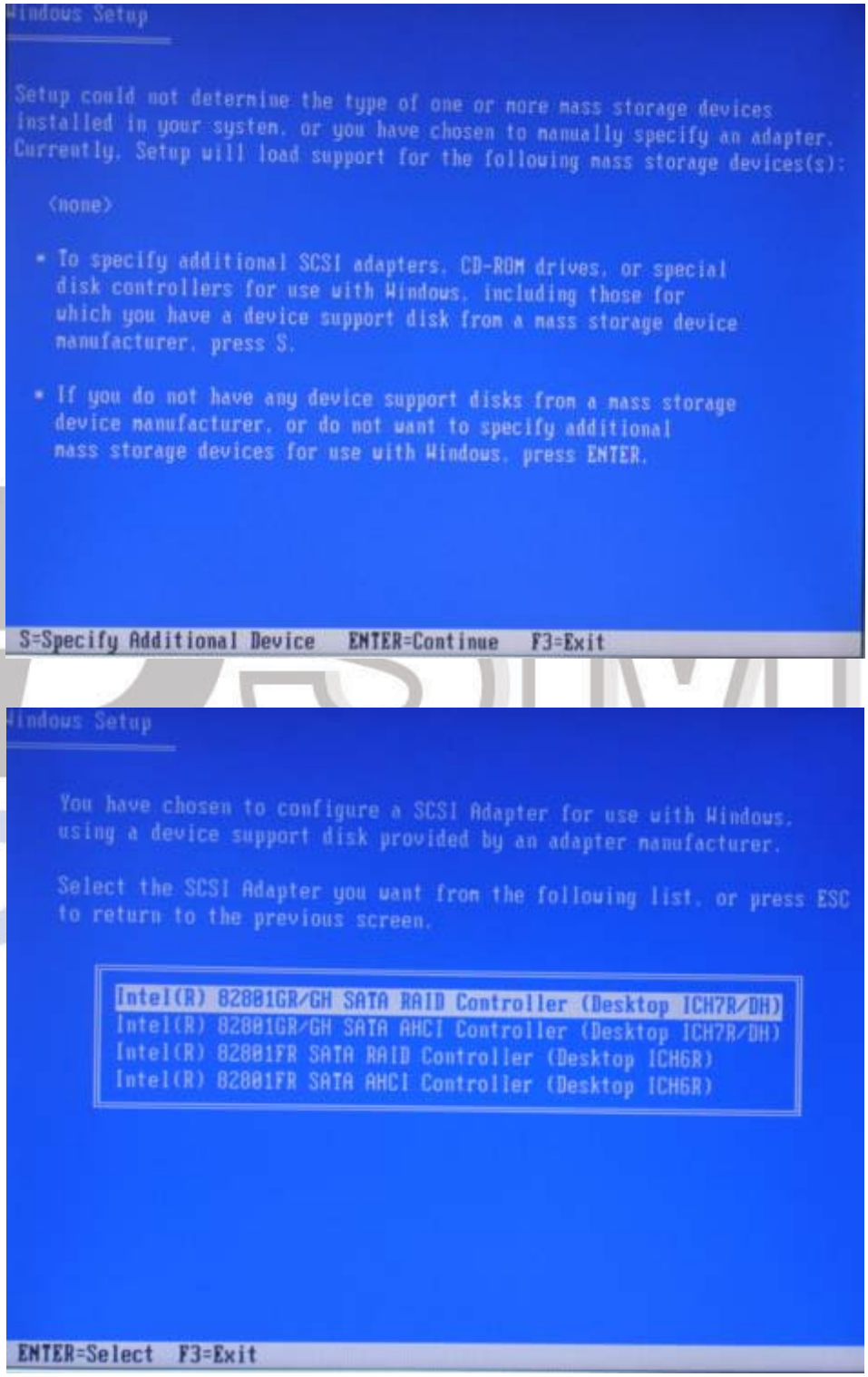

Intel(R) Matrix Storage Manager option ROM v5.0.0.1026 ICH7R wRAID5
Copyright(C) 2003-04 Intel Corporation. All Rights Reserved.
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID5(Parity) 64KB 149.1GB Normal Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
0 HDS722580VLSA80 VN6B3RCHC47M2E 76.7GB Member Disk(0)
1 HDS722580VLSA80 VN6B3RCHC437EE 76.7GB Member Disk(0)
2 ST380013AS 3JVASRV5 74.5GB Member Disk(0)
Press <CTRL-I> to enter Configuration Utility...

After entering RAID Configuration Utility, you will be able to Create, Delete, and Rest RAID Volume. Besides, RAID 0 and 1 can also be configured here as well.


Intel(R) Matrix Storage Manager option ROM v5.0.0.1026 ICH7R wRAID5
Copyright(C) 2003-04 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID5(Parity) 64KB 149.1GB Normal Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
0 HDS722580VLSA80 VN6B3RCHC47M2E 76.7GB Member Disk(0)
1 HDS722580VLSA80 VN6B3RCHC437EE 76.7GB Member Disk(0)
2 ST380013AS 3JVASRV5 74.5GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

After configuring RAID, make sure you have RAID driver diskette ready before starting to install your operating system. As for RAID driver diskette, please kindly check DSM AG Driver CD. Besides, to install RAID driver from disk, "**F6**" must be pressed as soon as system boots up from Windows XP installation CD.

After "F6", the following picture will be seen to specify RAID driver


Windows Setup
Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices(s):
<none>
• To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.
• If you do not have any device support disks from a mass storage device manufacturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.
S=Specify Additional Device ENTER=Continue F3=Exit
Windows Setup
You have chosen to configure a SCSI Adapter for use with Windows, using a device support disk provided by an adapter manufacturer.
Select the SCSI Adapter you want from the following list, or press ESC to return to the previous screen.
Intel(R) 82801GR/GH SATA RAID Controller (Desktop ICH7R/DH)
Intel(R) 82801GR/GH SATA AHCI Controller (Desktop ICH7R/DH)
Intel(R) 82801FR SATA RAID Controller (Desktop ICH6R)
Intel(R) 82801FR SATA AHCI Controller (Desktop ICH6R)
ENTER=Select F3=Exit

As you see the above picture, please select "**Intel® 82801GHM SATA RAID Controller (Desktop ICH7MDH)**", and now you are ready to start your Windows XP storage partition configuration.

5.2 Frequency Asking Questions

Q: I have one IDE hard disk and one SATA hard disk. How can I assign SATA Hard disk as First boot device?

A: After entering system BIOS, access Advanced BIOS Feature. And then press enter on Hard disk boot Priority. You will see the mode of your SATA hard disk. Select it as first boot device. Besides, please also notice. Every time, when your hard disk devices have been changed, system bios will ask you to re-setup Hard disk boot priority.

Q: Since BLUEBOARD has two Giga LAN onboard, can BLUEBOARD support Intel fault tolerance function, or what people called teaming function?

A: Yes, BLUEBOARD fully supports teaming function without any required change. What has to be done is to install Intel PRO drivers we provided in DSM AG Driver CD, and then go to device manager to enable teaming function. However, for further information, please feel free to contact support@DSM.AG, we can send teaming function guideline to you.

Q: I am using an ATA-66 (or 100) hard drive, how can I know that ATA-66 function is enabled?

A: You need to use the 80-pin ATA-66 IDE flat cable to have this function. During the Post phase, you can see ATA-66 (or 100) message while hard drive is being detected. Besides, after installing Microsoft series OS successfully, you also need to Install ATA-66/100 driver to active ATA-66/100 function.

5.3 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on AT or ATX power. CPU, CPU Fan, 240-pin DDR2 SDRAM, keyboard, mouse, floppy drive, IDE hard disk, printer, VGA connector, device cables, ATX accessories or 12V 4-pin power cable are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with BLUEBOARD, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "**Load Optimal Defaults**", press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that DSM AG has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS => Standard CMOS setup menu, pick up any one from Primary/Secondary Master/Slave IDE ports, and press "Enter". Setup the selected IDE port and its access mode to "Auto". This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the floppy drive, COM1/COM2 ports, Parallel port, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

Disable COM1 serial port to release IRQ #4
Disable COM2 serial port to release IRQ #3
Disable Parallel port to release IRQ #7
Disable PS/2 mouse to release IRQ #12,
Etc…

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System Counter
IRQ #1	Keyboard
IRQ #2	Programmed Controller
IRQ #3	COM2
IRQ #4	COM1
IRQ #5	Display, Network, USB 1.0/1.1 UHCI Controller
IRQ #6	Floppy Disk Controller
IRQ #7	Printer Port (Parallel Port)
IRQ #8	CMOS Clock
IRQ #9	ACPI Controller
IRQ #10	USB 1.0/1.1 UHCI Controller, Multimedia Device
IRQ #11	Network Controller
IRQ #12	SMBus , USB 1.0/1.1 UHCI, USB 2.0 EHCI Controller
IRQ #13	PS/2 mouse
IRQ #14	Data Processor
IRQ #15	Primary IDE Controller

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used.

Memory Area	Size	Device Description
0000-003F	1K	Interrupt Area
0040-004F	0.3K	BIOS Data Area
0050-006F	0.5K	System Data
0070-FE2E	54K	DOS
0E2F-0F6B	5K	Program Area
0F6C-9EFF	574K	[Available]
First Meg	-- Conventional memory end at 636K --	
9F00-9FBF	3K	Extended Bios Area
9FC0-9FFF	1K	Unused
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CE9F	58K	Video ROM
CEA0-EFFF	133K	Unused
F000-FFFF	64K	System ROM

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Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

IRQ#	Current Use	Default Use
IRQ 0	System ROM	System Timer
IRQ 1	System ROM	Keyboard Event
IRQ 2	[Unassigned]	Usable IRQ
IRQ 3	System ROM	COM2
IRQ 4	System ROM	COM1
IRQ 5	[Unassigned]	Usable IRQ
IRQ 6	System ROM	Diskette Event
IRQ 7	[Unassigned]	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	[Unassigned]	Usable IRQ
IRQ 10	[Unassigned]	Usable IRQ
IRQ 11	[Unassigned]	Usable IRQ
IRQ 12	System ROM	IBM Mouse Event
IRQ 13	System ROM	Coprocessor Event
IRQ 14	System ROM	Hard Disk Event
IRQ 15	[Unassigned]	Usable IRQ

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